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THE PROTECTIVE CLOTHING CONSTRUCTION FOR RURAL MALE DAIRY WORKERS OF NAINITAL, UTTARAKHAND

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ABSTRACT

This paper was focused on clothing practices and designing of appropriate clothing for rural dairy workers. The study was conducted on 25 male dairy workers of the rural region in Haldwani, Nainital, Uttarakhand. A survey was conducted with the help of interview schedule to draw out the information from workers. Fabric count, thickness and wet-ability were tested; thereafter, best fabric was selected and developed its' clothing for rural workers. Results revealed that the apron with cap (WMS 4.48) and lower with upper (WMS 4.76) were designed for rural dairy workers. The polyester taffeta fabric (WMS 3.28) and denim fabrics (WMS 2.72) were selected for these clothing. The polyester taffeta fabric has light weight (0.22 mm thickness) and 100 water resistance ability; whereas, denim.32nm thickness as well as 50 water resistance ability. It was concluded that these designed clothing protects the rural workers and improve their working efficiency.

KEYWORDS: Clothing Practices; Dairy Workers; Fabric Test & Protective Clothing

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INTRODUCTION

India is the world's largest single milk producer, with a total of 132.4 million tonnes of liquid milk produced in 2012-2013(WAP, 2014). It is a responsibility of every person to give some protection of dairy workers without affecting their work efficiency. These protections help of workers during work and remain our country position same in all over the world. Protective clothing is one of the shield or guard parts of the wearer, which improves safety of the people at the workplace (Wenner and Arias, 2003). The dairy workers engaged in various activities in the dairy farm viz.; rearing of animals, collecting milk and milk products, cleaning of shed and provide silage to animals (Singh, 2000). The health problems faced by the workers are headache, sneezing, muscular skeletal disorder, allergies, and infection at the time of work (Rani et. al. 2013). There are various types of protective accessories *viz.*, boots, mask, hand gloves, are available in the market to overcome the dairy workers from these problems. However, these protective accessories are not fully protecting the workers. There is need to develop the protective clothing for the dairy workers, which provide protection to them. Hence, keeping these points in mind the present investigation was carried out with the following objectives:

- To assess the clothing practices of the dairy workers.
- To develop the protective clothing for dairy workers.

MATERIALS AND METHODS

The present study was conducted in the rural region of Haldwani, Nainital, Uttarakhand. The study was descriptive as well as experimental in nature. There were various types of equipment, such as spray tester, fabric thickness tester and pick glass, used by the researcher during research, to assess the properties of fabrics. The survey was conducted in rural areas to collect the data from 25 male dairy workers. The personal interview schedule was prepared by the researcher, to collect the information regarding the clothing practices of workers. The various designs were shown to dairy workers and modified these after their suggestions. The data was tabulated and analysed by using appropriate statistical tools such as percentage, frequency and Weighted Mean Score.

RESULTS AND DISCUSSIONS

Table 1: Distribution of Male Workers According to Clothing Practices Preferred While Performing Dairy Work (N=25)

SL. No.	Clothing Practices	Male Workers	
		Frequency	Percentage
	Garment Used*		
1.	Paijama kurta	1	4
2.	Loose lower/trousers with T-shirt	25	100
	Use of Any Protective Guard		
1.	Yes	22	88
2.	No	3	12
	Clothing/Accessories Used by Them*		
1.	Gloves	7	28
2.	Waterproofing boots	8	32
3.	Saffa	11	44
4.	Wearing a over shirt and trouser	5	20
5.	Head cover	6	24
6.	No protection	3	12
	Protection of Body Parts Most Often Taken*		
1.	Head only	13	52
2.	Arms only	7	28
3.	Legs only	12	48
4.	Torso	2	8
5.	Face	6	24
6.	Without protection	3	12
	Season When Protection Was Taken*		
1.	In summers only	2	8
2.	In monsoon only	2	8
3.	Throughout the year	21	84

*multiple responses

It was investigated from the Table1 that all the male workers (100 percent) preferred to wear loose lower/trouser and T-shirt while performing dairy work. Very few of them wore paijama kurta *i.e.* 4 percent during performing dairy work. None of the workers wore the straight fit jeans with shirt at the time of dairy work. The reasons given by workers for preferring lower with T-shirt during work, because of comfort, ease of wear, easy care and cheap price. On the other side, Pant and Amit (2017) was concluded that female workers wore salwar kameez during dairy work. Boorady *et. al.* (2009) reported reverse results that the most common dress of the workers at the time of work was jeans (77 %) with a knitted shirt (72 %) in New York and California.

It is clear from the Table 1.2 that the maximum number of male (88 percent) workers used some protection while performing dairy work. Only few male workers *i.e.* 12 percent did not use any kind of protection at the time of work. However, more of them are using protection, but these clothing are not up to the mark to protect their body against the hazards. Hence, there was need to provide appropriate protection at the time of work.

It can be investigated from Table 1.3 that most of the male (44 percent) workers covered themselves from saffa at mixing of silage followed by 32 percent, 28 percent, 24 percent, and 20 percent who used waterproofing boots during rainy season, gloves during application of pesticides, head cover during cleaning of shed, wearing over shirt during threw of cow dung, respectively. ICAR (2015) also recommended protective clothing *i.e.* full sleeve apron with hood along with pleated mask/beak mask, glasses/goggles and sports shoes for threshing male workers. Boorady *et. al.* (2009) also reported that protective clothing was worn by the respondents over their clothes. The respondents were also preferred boots and hand gloves with these clothing. Therefore, male workers i.e. 12 percent did not use any kind of protective clothing/ accessories during working in dairy farms.

The data in Table 1.4 reveal that maximum number of male (52 percent) workers took protection of the head during dairy work followed by 48 percent, 28 percent, 24 percent and 8 percent who protects legs from boot, arm by gloves, face by scarf and torso by the shirt, respectively. Rani *et. al.* (2013) conducted the study on wheat threshing agricultural workers, and design kameez apron with a hood to cover their head, torso and hand at work place.

Table 1.5 reveals that the majority of the male (84 percent) worker, take protection throughout the year, while only 8 percent male workers take protection during summers/ monsoon. Ministry of New Zealand (2016) found that dairy farmers wore different kinds of clothing in different seasons. Workers wore woollen clothes in the winter season; while in summer season, they prefer sun protective clothing, sunglasses as well as a sun hat. Workers also select the light weight clothing that covers their skin.

Table 2: Distribution of Workers According to the Best Suitable Design and Fabric Chosen by Them

(N=25)

Sl. No.	Measures	Male	
		WMS*	Rank
Garment Designs			
Design 1	Lower upper	4.76	I
Design 2	Lower upper with hood	2.72	V
Design 3	Dungaree	3.52	III
Design 4	Apron	4.48	II
Design 5	Dungaree with hood	2.96	IV
Design 6	Kurta apron with elasticized waist	2.56	VI
Fabric Type			
Fabric 1	Polyester taffeta sliver coated fabric	3.28	I
Fabric 2	Camouflage fabric	2	III
Fabric 3	Khadi cotton fabric	2	III
Fabric 4	Denim fabric	2.72	II

* WMS Weighted mean score

It can be visualized from Table 2 that most of the male workers have given the rank I to lower and upper with WMS 4.76. Apron and dungaree has got II and III ranks with WMS 4.48 and WMS 3.52, respectively. Different types of fabric samples have shown to respondents. These were physically touched and visualized by them and gave the order of preference. The most of the male workers gave rank I to polyester taffeta sliver coated fabric for apron with WMS 3.28,

followed by denim fabric, camouflage and khadi cotton fabric that got II and III rank, respectively.

Table 3: Identification of Different Fabric Properties in Different Fabric Samples

SL. No.	Types of Fabric	Fabric Properties		
		Fabric Count (ends×picks)	Fabric Thickness (mm)	Wettability Rating
1.	Polyester taffeta sliver coated fabric	30×70	0.22	100
2.	Camouflage fabric	50×71	0.29	70
3.	Khadi cotton fabric	28×79	0.25	0
4.	Denim fabric	51×86	0.32	50

Table 3 shows that polyester taffeta fabric had less thickness (0.22mm) that means the fabric is lighter in weight as compared to khadi, camouflage and denim. The fabric count of the polyester fabric (30*70) is low, because of used untwisted yarns, instead of denim, khadi and camouflage fabrics used twisted yarns. The polyester taffeta fabric showed no sticking or wetting of upper surface (100 spray rating) because it has silver coating rather than denim, khadi cotton and camouflage fabric which have no special coating. Fabric count and fabric thickness are directly related to the wetability. It means that higher the fabric count and fabric thickness which cause delay water penetration. But, fabric used in this research already has water resistance quality. Therefore, the researcher was selected the light weight and water resistant polyester taffeta sliver coated fabric for apron and head cap. Hence, the polyester taffeta fabric was suitable for protective clothing.

Figure 1: Apron and Cap (During Work)

Figure 2: Lower and Upper (During Applying Ticks Killer)

According to all the above information, the male workers mainly engaged in the mixing of silage and provide feed to animals. Therefore, the workers were needed especial protection for upper body. Hence, focusing their need, the apron was designed with polyester taffeta fabric with black colour cotton lining *i.e.* shown in Figure 1. This fabric is easily washable and required less maintenance. The apron is provided with the flap pocket at front for keeping some useful

things. Apron with adjustable neck strap and generous cut makes these classic bib aprons the right fit for any type of body. This apron provides the protection during the work. On the otherside, the male workers were also engaged in the diary for killing ticks and insects. The workers were faced the higher problems during performing this work like headache, nausea and vomiting. The researcher, therefore, designs the upper and trouser for the male dairy workers that show in figure 2. Desai (2006) also suggested that protective clothing/ accessories were found to be highly acceptable to maximum number of respondents as protective clothing do not have an adverse effect on work efficiency, functional features/ fasteners used in the garments do not cause pinching.

CONCLUSIONS

It was concluded that most of the male workers were used saffa (44 percent) to cover their head and face from the dust. The workers (100 percent) also used T-shirt and lower while working in dairy farm because it was comfortable. The garments get dirty while performing work in dairy that can cause skin problems. Hence, the apron and head cap were designed by the researcher for the workers using water resistance polyester taffeta fabric which protect them from allergies. On the other side, denim upper and lower was also constructed to protect them during applying ticks killer and pesticides. The workers also reported that these protective clothing can be used by them throughout the year and it protects their bodies. Hence, these kinds of protective clothing are very much beneficial for rural farm workers. As it provides protection against harmful hazardous environmental conditions; at the same time, there is no adverse effect on workers' working efficiency.

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